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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/806,520	03/23/2004	Kalyan C. Cherukuri	TI-36594	2743
23494	7590	11/23/2005	EXAMINER	
TEXAS INSTRUMENTS INCORPORATED			NGUYEN, THINH T	
P O BOX 655474, M/S 3999			ART UNIT	
DALLAS, TX 75265			PAPER NUMBER	
			2818	

DATE MAILED: 11/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/806,520

Applicant(s)

CHERUKURI ET AL.

Examiner

Thinh T. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 15 September 2005.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-11 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-11 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 23 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

### **DETAILED OFFICE ACTION**

1. Applicant's election of claims 1-11 for prosecution without traverse in the communication with the Office on 9/15/2005 is acknowledged.

### **Specification**

2. The specification has been checked to the extent necessary to determine the presence of all possible minor errors. However, the applicant cooperation is requested in correcting any errors of which the applicant may become aware in the specification.

### **Claim Rejections - 35 USC § 102**

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102(a/b/e) that form the basis for the rejections under this section made in this office action.

A person shall be entitled to a patent unless --

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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4. Claim 1,5-6,8-10 are rejected under 35 U.S.C. 102(e) as being anticipated by Her et al. (U.S. Patent 6,650,009).

REGARDING CLAIM 1

Her discloses ( in the abstract, fig 3A,fig 3B) a semiconductor device comprising: a substrate ( fig 3B,reference 302) having conductive interconnections; two or more vertically stacked chips on said substrate, each supporting chip having metal standoffs ( fig 3B, reference 320a ,320b,column 4 lines 28-32) thereon to separate it from the next successive chip; and a plurality of bond wires connecting at least one chip to said substrate.

REGARDING CLAIM 5

Her discloses ( in the abstract, fig 3A,fig 3B,reference 320a,320b,column 4 lines 28-32)

A semiconductor device wherein the metal standoff are thermally conductive.

REGARDING CLAIM 6

Her discloses ( in the abstract, fig 3A,fig 3B,) a semiconductor device wherein the metal standoff are surrounded by bond pads.

REGARDING CLAIM 8

Her discloses ( in the abstract, fig 3A,fig 3B,) a semiconductor device wherein the bonds wires connect more than one chip to the substrate.

REGARDING CLAIM 9

Her discloses ( in the abstract, fig 3A,fig 3B,) a semiconductor device wherein the substrate is a BGA ( Ball Grid Array ) package substrate.

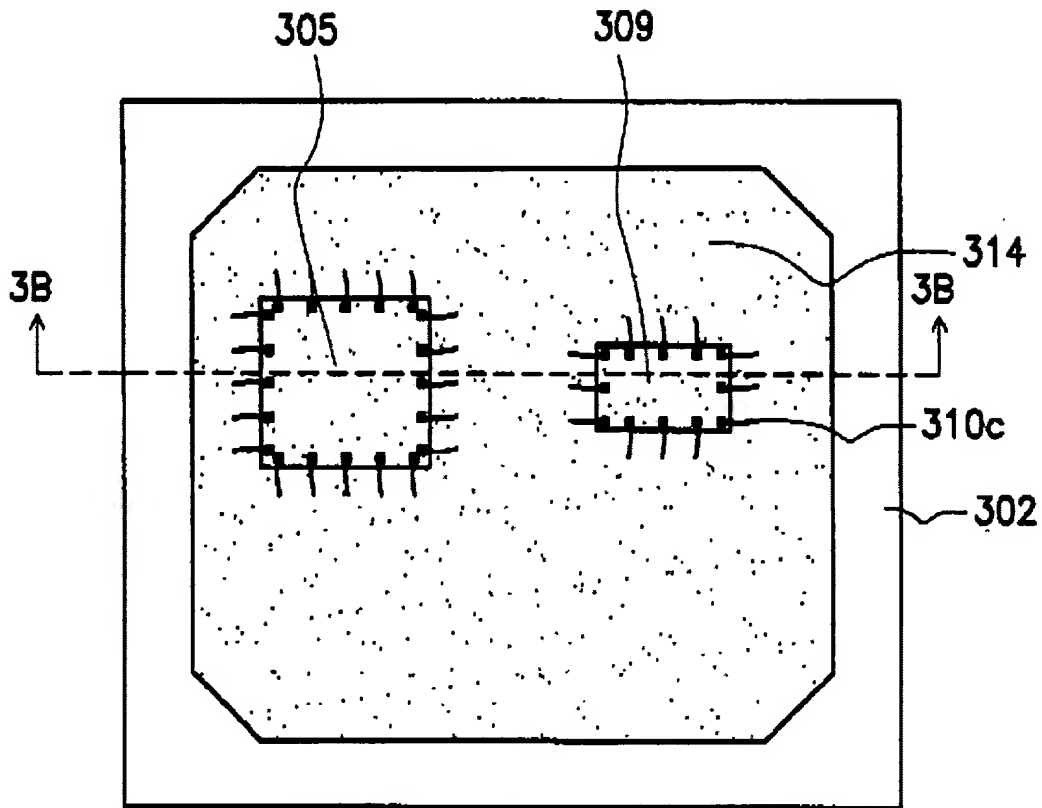


FIG. 3A

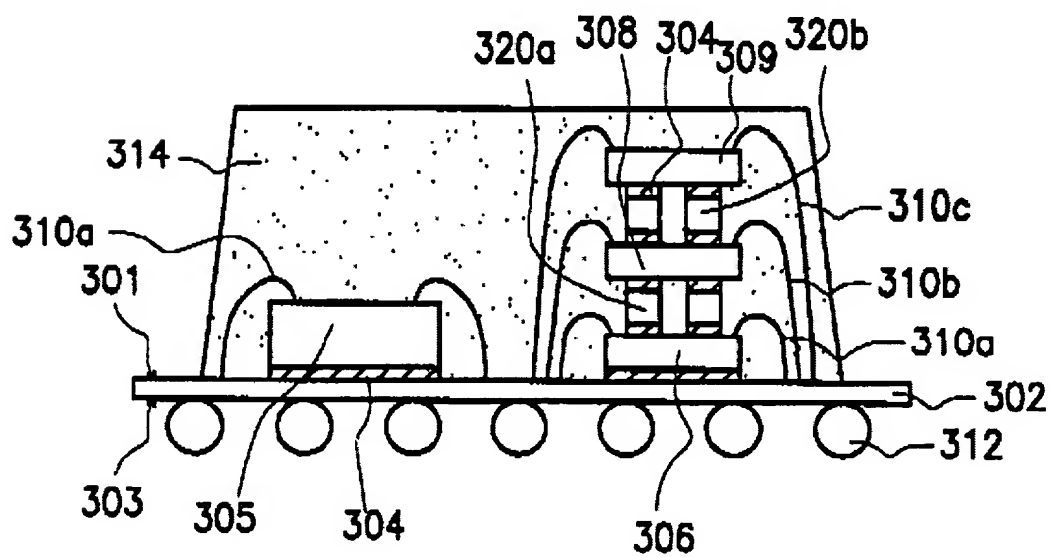


FIG. 3B

REGARDING CLAIM 10

Her discloses ( in the abstract, fig 3A,fig 3B) a semiconductor device wherein the metal standoffs have uniform height.

**Claim Rejections - 35 USC § 103**

5. The following is a quotation of U.S.C. 103(a) which form the basis for all obviousness rejections set forth in this office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 2,3, 7,11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Her et al. ( U.S. patent 6,650,009) in view of further remark.

REGARDING CLAIM 2

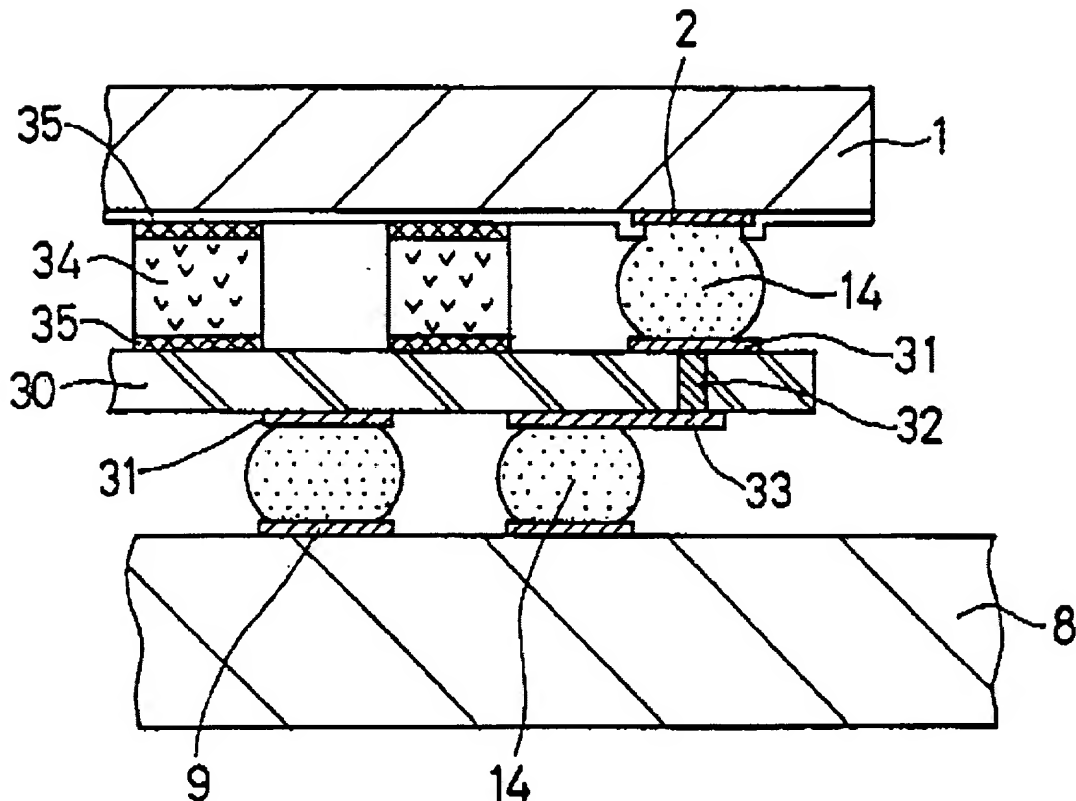
Her et al. ( in the abstract, fig 3A,and fig 3B,column 4 lines 18-32) disclose all the invention including metallic islands standoff except for going into specific details that the metal standoff comprises aluminum islands. This feature, however, is considered obvious because the use of aluminum standoff is old and well known in the art. as evidenced by the disclosure by Baba (US patent 6,016,013 fig 5 and column 2 lines 1-4)

A person skilled in the art at the time the invention was made would be able to use the teachings by Her and his own routine design skill and come up with the invention of claim 2

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Without any special instruction.

FIG. 5  
PRIOR ART



BABA (US patent 6,016,013) DISCLOSURES.

REGARDING CLAIM 3

Her et al. ( in the abstract, fig 3A, and fig 3B, column 4 lines 18-32) disclose all the invention except going into detail of the thickness of the metal standoff. This feature, however, is considered obvious since it has been held that where the general condition of a claim are disclosed in the prior art; discovering the optimum or workable ranges involves only routine

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skill in the art. A person skilled in the art at the time the invention was made would be able to use the teachings by Her and his own routine design skill and come up with the invention of claim 3 without any special instruction for the purpose of optimization of the HER device.

#### REGARDING CLAIM 4

Her et al. ( in the abstract, fig 3A, and fig 3B, column 4 lines 18-32) disclose all the invention except going into detail about a passivation layer on top of a substrate.

This feature, however, is considered obvious since the use of a passivation layer on top of a substrate is old and well known in the art as evidenced by the disclosure by Lee et al. (US patent 6,818,545) in fig 5, in column 6 lines 30-36.

The rationale why claim 4 is obvious over Her et al. has been discussed in the rejection of claim 2.

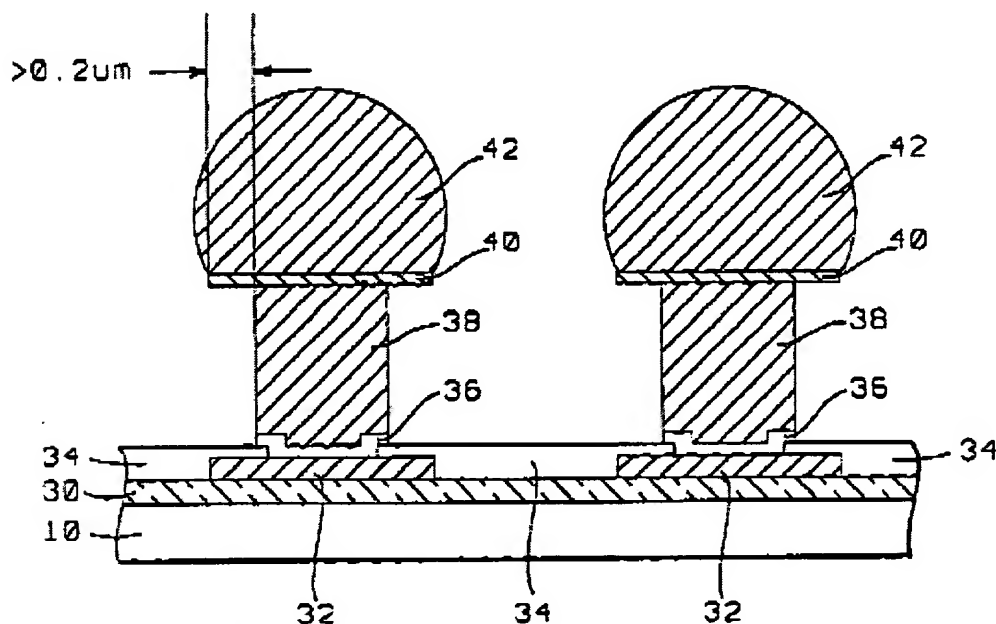


FIG. 5

LEE et al DISCLOSURE



REGARDING CLAIM 7

Her et al. ( in the abstract, fig 3A,and fig 3B,column 4 lines 18-32) disclose all the invention except going into detail about using a polymeric adhesive.

This feature, however, is considered obvious since the use of polymeric adhesive is old and well known in the art as evidenced by the disclosure by Hultmark et al. (US patent 6,232,667 column 2 lines 4-6)

A person skilled in the art at the time the invention was made would be able to use the teachings by Her 099 and his own routine design skill and come up with the invention of claim 2 without any special instruction.

REGARDING CLAIM 11

Her et al. ( in the abstract, fig 3A,and fig 3B,column 4 lines 18-32) disclose all the invention except going into detail about using the copper bond pads with aluminum caps.

This feature, however, is considered obvious since the use of copper bond pad with aluminum caps is old and well known in the art as disclosed by Applicant Admitted Prior art in the background section (page 3 lines 20-25 of the specification.).

The reason why claim 11 is obvious over Her has been set forth in the rejection of claim 2.

7. When responding to the office action, Applicants are advised to provide the examiner with the line numbers and the page numbers in the application and/or references cited to assist the examiner to locate the appropriate paragraphs.

8. A shortened statutory period for response to this action is set to expire 3 (three) months and 0 (zero) day from the day of this letter. Failure to respond within the period for response will cause the application to be abandoned (see M.P.E.P. 710.02(b)).

### CONCLUSION

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thinh T Nguyen whose telephone number is 571-272-1790. The examiner can normally be reached on Monday-Friday 9:30am-6: 30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached at 571-272-1787.

The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval [ PAIR ] system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

**Thinh T. Nguyen**

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A handwritten signature in black ink, appearing to read 'Thinh T. Nguyen', is written over a horizontal line. The signature is fluid and cursive.